GOVERNMENT RESILIENCE POLICY AND SUSTAINABLE DEVELOPMENT GOALS: Food System Resilience (A Comparative Study BetweenIndonesia And The Gambia).

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Abstract

The purpose of applying socio-ecological resilience is that there are significant changes in climate and scientist established that the planet is getting wormer on yearly basis and sea levels are rising. The climate pattern is also changing rapidly and rainfall shortage become a challenge. Human actions are responsible for changing climate through emission of greenhouse gas in atmosphere which keep depleting the ocean layers by make the planet earth wormer. Disaster is a natural phenomenon that happen with or without the expectation of human. Food system resilience is important in this discourse as disasters are an unforeseen circumstance. The concept of resilience was introduced in development to help resort the communities affected by the natural calamity. Governments formulate resilience policy as a strategy for disaster preparedness. This article used qualitative analysis in discussion. Food system resilience was used in the context of socio-ecological system which entail environmental issues and societal values in ensuring food security. Food system resilience was discussed in connection to SDGs goal number two (Zero Hunger). The weight of the discussion is centred around socio-ecological system in boasting food security.It is evident that the two countries have something in common but defer in many aspects of their development priorities and pace. They both need more improved crops or variety of cereals to ensure food security and public awareness creation on resilience policy and actions is a necessity.

Key Words: Resilience, policy, disaster, climate, change, sustainable, development, food system, socio-ecological

INTRODUCTION

According to the former President of US Barrack Obama at UN Climate Change Summit in New York, US, 2014; "who states that the climate is changing faster than our efforts to address it. The alarm bells keep ringing. No nation is immune. Worldwide, this summer was the hottest ever recorded, with global carbon emissions still on the rise. We are the first generation to feel the impact of climate change and the last generation that can do something about it". It is quite clear that the prediction of scientists is gradually coming to light which necessitate the need to have resilience plans and policy to mitigate the impact of natural disasters as well as taking more sustainable measures to development. Several undertakings were made to address the climate change and international agreements reached to commit the world nations to reduce the adverse effects of human actions on the environment. Since 1992, climate change discourse is always on atcentre stage of international development affairs and United Nations is very much committed to this cost of reducing the negative impact of climate change on the environment. "Since global climate change was put on the international political agenda in1992, developments in both climate science and climate policies have been swift,taking into account the complexity of the issues at stake. On the political side, theUnited Nations Framework Convention on Climate Change (UNFCCC) was agreedupon in 1992, and the subsequent Kyoto Protocol with legally binding commitments was signed in 1997" (Munasinghe& Start, 2005, p1). However, other developments are staged after Rio de Janeiro, UNCED 1992 and Kyoto 1997 which includes Hague climate change negotiations in 2000 and subsequent agreement on the detailed cookbook which describes the implementation modalities in 2001 at Bonn in Germany. Actually, United Nations Framework Convention on Climate Change came into forced in 1994.

Government resilience policy geared towards disaster response strategies and mitigation measures to address shock or provides coping mechanisms to disasters and its related events. The policy also serves a guiding principle to disaster response coordination efforts and rehabilitation process to reduce the negative impactsof disaster on lives people and mitigation measures. Policy refers to what government have desired to do or not to do. It could also refer to as government activities or programs which are responsive to the welfare of her people. This paper will give conceptual account of resilience in international development affairs and brief evolution of the concept of resilience will be discussed. These accounts will be supported by theories and appropriate approaches to Disaster Risk Reduction strategies and UN agreements on disaster risk reduction.

Sustainable development seeks to address the needs of the present generation without jeopardizing the needs of the future generation to come. It advocates for wise uses of resources so that the future generation can meet their own need. The concept of

sustainable development was first used in 1980's by International Union for the Conservation of Nature in their publication called World Conservative Strategy wherein sustainable development was used as a global priority for conservation biodiversity and ecosystem. "The 'Brundtland' report, as it became known, authored by Dr. Gro Harlem Brundtland (Director General of the World Health Organisation), explicitly introduced the term 'sustainable development' as a conceptual bridge to bring together environmentalists and industrialists" (Singh, 1998; Strong, W. Alan, 2006).Bruntland report also mentioned the concept of sustainable development in 1987 and it defined sustainable development as development that meets the needs of the presents without compromising the ability for future generation to meet their own needs. Since then, the concept of sustainable development has been entrenched in the development sphere which has developed beyond the initial intergenerational framework to focus on the goal of social inclusion and environmentally sustainable economic growth.In addition, world nations met in Rio De Janeiro in 1992 to further discussed on the environmental issues such as climate change and its consequences. Representatives from 178 countries converged at this conference and 27 principles of guiding action on environment and development which was named as The Rio Declaration on Environment and Development (UNCED, 1992). Thereafter, Agenda 21 came into being in 1996 which was later extended to 2000 and "this process of LA21 has come to mean two things, firstly a consultative process leading to wider involvement and empowerment, and secondly, implementing Agenda 21 at a local level in such a way as to involve the community and other interested parties" (Chambers, R., Conway, 1991; DFID, 1999; Strong, W. Alan, 2006). The agenda 21 does not have any legal binding on countries and its impact could be unnoticed.

Consequently, we currently in sustainable development era; in which seventh Sustainable Development Goals were set as a development priority for all the world's nations to use as an indicator or guide in their development endeavours. It came into existence in 2015 as a development agenda for the world. This paper will use qualitative method to discuss SDG goal 1 (Zero Hunger) in the context of food system resilience through the lenses of socio-ecological framework. It will provide narrative about resilience policy as well as compare and contrast the resilience policy in Indonesia with Gambia.

The socio-ecological framework on resilience is used in this article to discuss issues pertaining to factors that help achieve the food security and proper functioning of the food system. This will also unveil and give account of how to maintain the functioning of the system in its original form. The normative nature of food system makes the resilience of food system different from the broader concept of resilience in socio-ecological system. The stability of the system is the main priority of food system management and policy. It is evident that the society needs food for sustainability of

lives to provide for everyone in more equitable manner to enhance livelihoods and prevent environmental degradation. The society should be able to response to shock and uncertainty that the world has to offer.

This article explained resilience as it has been conceptualized in communities of scholars and practitioners given particular attention on social-ecological system change. It is significant to recognize the pivotal role of socio-ecological resilience in increasing the sustainability of food systems. Some term emerge is required to address the pattern of normative judgments related to food systems. Critical analysis was applied to the concept of food system resilience through identifying the attributes of resilience that are most important in the food system context for increasing sustainability. Then, the impact of climate change has on food production, processing, distribution and consumption. It was also established that the rainfall pattern has change drastically in both countries which has affected the agricultural sector and food system due to adverse effects of climate change. This article concluded by looking at the primary constraints and opportunities in policy aspect of resilience approach to food systems and food production processes.

CONCEPT OF RESILIENCE IN GOVERNMENT POLICY

In 20th century, the resilience concept was used as a potential fruitful concept for the analysis on socio-ecological systems. It has recently been used in food security analysis to adequately inform the policy makers. However, the concept of resilience was first introduced in field of ecology and then into development activities and programs. It is evident that resilience is an integral part of development and environmental protection measure since most of the development projects or programs success level are measured according to how resilient the program is. “In a broader perspective, resilience is a measure of the capacity of the system to withstand stresses and shocks as well as its ability to persist in an uncertain world” (Wu & Wu, 2013). Resilience focused on the coping mechanisms and adaptive measure of the households to recover from shocks or stresses. Sometime, resilience varies from one person to another or one society to another because our resilience level differs. “The resilience approach views humans aspart of the biosphere, and assumes that the resulting intertwinedsocial–ecological systems behave as complex adaptive systems i.e. they have the capacity to self-organize and adapt based on pastexperience, and are characterized by emergent and non-linear behaviourand inherent uncertainty” (Biggs, Schlüter, & Schoon, 2015). It is obvious the humans play crucial role in changing the biosphere and therefore, human actions need to checked to ensure resilience of socio-economic development. Resilience is viewed as a complex system because humans and their environment have a symbiotic relation which is intertwined to the extend of inseparable. The quality of humans’ lives depends on the quality of their environment and food systems.“Resilience enhance adaptive capacity (see above) Sustain legacies that provide seeds for renewal Foster a balance between stabilizing feedbacks and creative renewal as well

as adapt governance to changing conditions" (F. Stuart Chapin, III, Gary P. Kofinas, 2009).Resilience is a dynamic concept that does not only deal with the systems' ability to withstands shocks or stressors but possibility to re-organized and adapt to new conditions. It also enhances self-organisation and innovation to advance on the threshold of the households' livelihoods.The resilience framework looks at the root causes of household vulnerability instead of trying to predict the likelihood of falling short of a given food intake threshold. The resilience framework is more interested in understanding what the strategies adopted by a household to gain its own livelihood are and how those livelihood strategies will withstand (or possibly adapt to cope with) future crises or disasters.

Resilience to food insecurity is defined as the system ability to maintain a certain level of well-being (food security) in the face of risks. The resilience approach to food security analysis provides a framework for understanding the most effective combination of short and long-term strategies to prevent households from falling into poverty and/or hunger.Since 50s, the unprecedented growth of human population has post threat to food security and it also increase opportunities for innovation through mechanise farming systems. Like mentioned earlier, human actions are responsible for the changing climate and environmental depletion such as erosion, flood, drought, deforestation, etc. These issues make the environment vulnerable to hazards and disasters. "Vulnerability theory is rooted in socioeconomic studies of impacts of events (e.g., floods or wars) or stresses (e.g., chronic food insecurity) on social systems but has been broadened to address responses of entire social–ecological systems" (F. Stuart Chapin, III, Gary P. Kofinas, 2009)."Vulnerability to a given stress can be reduced by (1) reducing exposure to the stress (mitigation); (2) reducing sensitivity of the system to stress by sustaining natural capital and the components of wellbeing, especially for the disadvantaged; and/or (3) increasing adaptive capacity and resilience to cope with stress" (F. Stuart Chapin, III, Gary P. Kofinas, 2009). The vulnerability level differs from one place to another and the adaptive capacity to absorb shocks or stressors. It is vital important to note that the capability to restored from disasters shows the level resistance to change. Change is inevitable and every social change comes with consequences but it must be properly managed to mitigate the reverse effects of those changes."The concept of resilience is clearly related to other configurations of environment society relationships such as vulnerability and criticality, some of which have an explicit spatial dimension to these social processes"(Adger Neil, 2000). This narrative account for institutional resilience and environmental vulnerability which is critical to the livelihood of the people.

Furthermore, government resilience policy is to ensure continuity of livelihoods of the people while sustainability advocate for wise uses for resources for the betterment of all and Sundry. The socio-ecological systems are aimed at providing ecosystem services without interruption or there is, at a very minimal level. "Resiliencebased ecosystem stewardship builds on ecosystem management by emphasizing (1) the key role of resilience in fostering adaptation

and renewal in a rapidly changing world; (2) the dynamics of social change in altering human interactions with ecosystems; and (3) the social–ecological role of resource managers as stewards who respond to and shape social–ecological change" (F. Stuart Chapin, III, Gary P. Kofinas, 2009). The interdepend nature of human lives and ecosystems crucial to resilience policy. Government resilience policy should be informed of resilience policy framework approach to enhance livelihoods of the households.

In addition, the government resilience policy is inconsequential if they don't translate to the advancement of the livelihoods of the households. Its focus should be centred around the welfares of the households and be aware of how to mitigate the hazards in their environment. Government resilience policy should be transformable to enhance diversity, adaptation, and resilience to identify potential future options and pathways to get there. "The good governance agenda of SDGs generally prioritized commitments of world governments to improving transparency, broadening participation and ensuring social inclusion in deliberative processes, eliminating corruption and promoting institutional reform" (FAO, 2017). This is catalyst to inclusive growth and sustainable development in ensuring food security and improved well-beings.

SUSTAINABILITY AND FOOD SYSTEM RESILIENCE

Sustainability bridge gap between development and environment. Research has shown that sustainability can achieve in short run but not in long run. Therefore, the concept of sustainability is simultaneously with development. Sustainable development is defined as the development that meets the needs of presence generation without compromising the needs of future generation to meet theirs. This definition was given by Gro Brundtland in 1987 (Brundtland's report) and it is the most accepted definition because it increases long term wealth and well-being of people. It advocates for the wise uses of both material resource and non-material resources. Food system is the path that food travels from field to fork which includes growing, harvesting, processing, packaging, etc, and disposing of food. This system is input needed and outputs generated. Food system does not operate in vacuum but operates in and influence by actors such as; social, economic, and environment."From the model above, we see that the key system activities, of producing, processing and packaging, distributing and retailing, and consuming food, involve the on the ground actors as part of food system processes" (Toth, Rendall, & Reitsma, 2015). The food system begins with the producer to the end user which is regarded as consumer.

"A characteristic of OECD country food systems is the growing importance of regulatory interventions aimed at ensuring food safety, consumer protection, environmental protection and intellectual property protection. The requirement to meet specific regulatory standards before a product can be sold on the domestic market is not usually aimed specifically at

imported products, but even where this is not the case, standards have an indirect influence on agricultural output and trade. Policy coherence initiatives must take account of the growing importance of these non-tariff measures in OECD countries and this the third domain of analysis"(OECD, 2005). This has highlighted some points that salient to sustainability of food system and resilience became an alternative measure to recover from shock or system failure. This point also confirmed that standards has little or no effect on the output of food system. In most cases, the regulatory inventions and standards impact more on the export of food products to international market which has shown some changes in food system and agricultural practices to diversify and engage in value addition. "For many small-scale operators, issues of financing, market accessibility and transport, as well as the range of standards related to quality, traceability and certification make participation in integrated value chains difficult" (FAO, 2017). In addition, the supply chain of food products also changes with an increase in establishment of supermarkets wherein distribution of food products is highly concentrated in urban and re-urban areas. One may argue that urbanisation is one of reason of changing trend in agriculture and food production. "Agriculture and food production are increasingly supplying urban and peri-urban supermarkets. Value chains are progressively characterized by the vertical coordination, and in some instances the integration, of primary production, processing and distribution; the automation of large-scale processing; and higher capital and knowledge intensities" (FAO, 2017). It is essential to note that agriculture and food production is capital and knowledge intensities through innovation with introduction of improved and drought resistant crops.

Moreover, it is important to states that certain regulations and standards prose some challenges to indigenous food production process through increasing the expenditure. This also threatened the food security as some food products may be lose because of standards and regulations. "Food safety and quality standards imposed by supermarkets and regulators may lead to the discarding of food that is still safe for human consumption, representing an enormous waste of natural resources. Therefore, the evolution of food systems needs to be assessed not only in terms of economic efficiency and capacity to improve food security, but also in terms of their environmental impacts along the entire food chain" (FAO, 2017). There comes the sustainability of the food system to ensure continuity of stable food production and improve on food security to eradicate for insecurity. "Indigenous food systems have characteristics that make them particularly attractive, including the use of both cultivated crops and gathered wild plants, synergies with the natural environment and biodiversity, close adaptation to local conditions, a high level of diversification, a light carbon footprint, fewer 'negative externalities' and reduced use of external inputs. They are closely tied to culture and social and religious activities" (FAO, 2017). This is a clear testimony that food system resilience will enhance environmental quality to support food production strategies and mitigate negative externalities. In this case, the conditions of adaptation will also promote diversification of indigenous food system."In terms of the environment, the food

industry contributes significantly to pollution and greenhouse gas emissions, and threatens biodiversity; climate change may contribute to increasing the instability of production and hence that of markets and prices. The increasing scarcity of fossil fuels and increased competition between food and energy uses for agricultural products may also contribute to market tensions" (Catherine Esnouf, Marie Russel, 2013). This necessitate the discussion of socio-ecological system as it is all inclusive approach to explain and address environment and development in which food system is component of.

SOCIAL AND ECOLOGICAL SYSTEMS

Complex environmental problems such as climate change, soil loss, biodiversity loss and ground water scarcity has been constantly increasing in relevance in both scientific, policy, and public domains. These problems have impacted serious on food system.Holling (2002) introduced the adaptive cycle to describe the general characteristics of dynamic change in ecosystems as comprising four phases such as exploitation, conservation, release and reorganization. The experience of various scholars has led the insight that these complex problems cannot be unleased with disciplinary approach alone. They have to be dealt with in an integrative interdisciplinary which was considers the interactions between social and ecological systems. Within the last decade significant progress has been made with respect to interdisciplinary investigation and modelling of couple socio-ecological systems. Various research approach has been developed and applied to different studies in which the interaction between social system and the ecological system has been explicitly considered. These approaches include, (1) combining material or energy flows and economic flows; (2) modelling human behaviours and factors that impacts in some form on the ecosystem; (3) identifying, modelling and trying to quantify ecosystem services within an economic context; (4) studying the resilience and adaptive capacity of social ecological system.

All these different approaches take system theory as the theoretical underpinning using it to look at and place emphasis on various aspects of socio-ecological model of interaction. Systems in that they are composed of a set of parts that are interdependent in effecting some joint outcome.

"Biodiversity conservation requires an understanding of social systems and their interactions with ecological systems. People have been maintaining and protecting some areas as untouched on different conservation structures and management strategy. For instance, indigenous communities have been conserving sacred forest areas under the strong religious, cultural and spiritual belief"(Mohamed Behnassi, 2014; Wilkinson, 2012). this is evident in most indigenous communities. One such example in Surabaya City is BAMBU forest and similar of it is found in the Gambia called Kachikally at Bakau.

A socio-ecological system is a type of complex adaptive system composed of two primary subsystems a human society and economy on the one hand and a biological ecology on the

other. They are composed of a set of parts that are interdependent in affecting some join outcome. They are complex in that they typically consist of many parts interacting in a nonlinear network fashion. They are adaptive; in that the components in the system change their state in response to that of others and in this capacity of socio-ecological systems exhibit strong co-evolution as they develop overtime like all complex systems socio-ecological systems are multi-dimensional. They exist on many qualitatively different levels within the ecological domain we have basic geological processes taking place in the hydrological cycle. Mineral cycles atmosphere and various biological processes within the social domain; we have technology and industrial infrastructure, economic, social, and cultural institutions all of these levels are interacting and co-evolving added to these socio-ecological systems exist. "An all scales from the individual to an agricultural farm to a metropolitan area to a nation-state to the whole global economy and the supporting biosphere. The theory and science of socio-ecological systems is then focused on these two subsystems and how they interact" (Mohamed Behnassi, 2014). These will first provide some generic description of these two major subsystems before going on to talk about their interaction.Like all complex systems both ecologies and economies are regulated on the macro scale by a set of feedback loops but the internal dynamics of each system is governed by different set of feedback loops.As mentioned previously natural ecologies are governed by the law of thermodynamics. The input of energy from the sun and earth core drives the whole system and this energy is processed through networks of connections within abiotic and biotic processes. This is a complex system that is evolved over millions of years ago. Through, this evolution negative feedback loops have developed the work to stabilize the system on various levels as previously discussed about ecosystems in all phases will attempt to move away from thermodynamic equilibrium.

Selecting the components and the organization that yields the maximum flux of useful energy throughout the system and the most energy stored in the highest level of what is called ascendancy. The social component is what we might call an economy consisting of both social institutions and technology infrastructure or we can call a socio-technical system an economy is an engineered. Social construct produced by human beings for human beings. This industrial ecology has also evolved over a long period of time. According to the logic of providing humans with things that they need and once in an economic version and also in congruence with the set of cultural and social institutions of those societies today on the micro level."Social, ethical and spiritual relationships thus have an ecological foundation; and the practical manifestation of cultural values can have consequences for the ecological system (ibid.). Failure to recognize this interaction means ignoring the role that cultural practices play in the shaping of landscapes and the maintenance of biodiversity and ecosystem services" (Mohamed Behnassi, 2014; Wilkinson, 2012). This is done primarily through the vast supply chain network of our global economy and regulated by public policy and increasingly by market mechanisms. These market mechanisms recognize value in terms

of utility which can be correlated to the desire or want of some economic agents. Here, the feedback loops are structured around the industrial supply and demand which has put much pressure on the environment and urban expansion of the 20th century has significant effect on the food productions system.

The interaction between these two systems then involves the exchange of energy matter and information is crucial to discuss. Human society and economy are deeply dependent upon the natural environment and this flow of natural resources of all kind from the ecosystem to the economy is called ecosystem services. These include broad categories of services like provisioning such as the production of food and water, regulation such as the control of climates and diseases, supporting nutrient cycles and crop pollination as well as cultural aspect of social life such as spiritual and recreational benefits. Inversely, we can look at the exchange from the economy to the biosphere which includes both energy materials and information on economies as dissipative systems take in large amount of energy and materials and export waste material back to the ecosystem but as mentioned previously that humans can now be understood as the regulators of the earth's systems and destroyers of the same earth's systems. Human society plays a fundamental role in designing ecosystems around the planet, we have essentially replaced many natural regulatory processes with those that has been engineered. It is evident that human actions have adverse effect on the environment and the altering of hydrological cycles through irrigation, nitrogen cycle through agriculture carbon cycles and combustion or just the steer movement of biomass. We engineer all the earth's systems on almost all scale. Complex systems such as socio-ecological systems are regulated by distributed feedback loops for a system to be under regulation or under control which means that it has negative feedback counter balancing the different forces. These feedback loops can be seen everywhere in economies and ecologies.

FEEDBACK LOOPS

A system becomes out of control when these negative feedback loops become broken and we see this often with socio-ecological systems. For instance, in a situation where humans can gain economic value from the natural environment with the economic expenditure to balance them is often retarded by human actions. Thus, the system stays developing off in that direction but equally; it happens the other way around. The economic activity breaks some natural feedback loops and some elements within the ecosystem is released from the natural feedback loop that stabilizes them such as invasive species where we put a creature into an environment without any natural predator leading to a destabilization of the ecosystem. "The structure and functioning of an ecosystem is sustained by synergistic feedbacks between organisms and their environment" (Samways, 2005). This is important to further development of other species and growth of environmental viability. The environment will have capacity to revitalise and reorganize itself for more advance biodiversity. The significance of biodiversity depends surely on the preserving ecosystem resilience which is

crucial to the ability for the system to response to ecological services in order to put further mitigation measures and adaptive strategies for stress and shock.

Moreover, discussing the Anthropocene human society and economy has evolved with the natural environment over thousands of years starting with all other creates subjects to the same natural feedback loops and regulation within the ecosphere but through successive technological and economic transformations. Human developed engineered environments with their own set of internal economic feedback loops. Its own value system that has become largely coupled from natural environment in order for the feedback loops to work. There has to be some uniform value in order to enable feedback to regulate the two systems in an integrative fashion. It needs to define some common metric of value. Big part of the challenge presented today trying to correlate value between the two systems and quantify it.Economic values are some what extent but defining what exactly the value of an ecosystem services would appear to be much more complex of what we are trying to do, though; it is by valuing ecosystem services be able to manage them through economic feedback loops by incorporating the value of these things into economic accounting try to make people financially accountable for their effect on the natural environment. “The lack of response to feedback on fish stocks, and overcapitalisation in highly fluctuating fisheries may lock the system into a rigid pattern. This prevents flexible adaptation to ecosystem dynamics, as management efforts focus on the short-term problems at hand, trying to maintain the fishing fleet rather than the fish” (Samways, 2005). This is currently affecting the Gambia since the government issues license to Chinese vessels or fishing boats to permit them to fish in Gambian Ocean, thee is massivefish shortage in the market which is not good for economy. In contrast, Indonesia is becoming highly industrial and yet poverty is still persisting as well as disaster from country.

ECOLOGICAL VALUES

Ecosystem servicesdefined their ecosystem value in relation to human utility but ecosystems require the functioning of many internal subsystems in order to enable the functioning of the whole system. Plants might mean nitrogen fixing microbes that will themselves be of no economic value but are still required to maintain that ecosystem in a functional stage. This intrinsic value required to maintain that ecosystem in a functional stage so that they can render services which cannot be easily given immediate economic value. It is in this sense that public goods require an associated socio-cultural framework for supporting it. The derivative value of the ecosystem may be given immediate economic value but the primary value that supports the maintenance of the ecosystem is of a different kind and may require social and cultural coordination. This is described by the circled tragedy of the commons. The tragedy of the commons or social dilemma is a dynamic where it is in the best interests of each individual to over use a resource unless everyone else does likewise. The dilemma arises when members of a group share a common good such as ecosystem. When this

common good is rivalries and non-excludable meaning that anyone can use the resource but there is a finite amount of resources available and is therefore prone to over exploitation. The tragedy of commons has proven to be a core dynamic within the management of many socio-ecological systems around the world from the management of forestry to pasture and in particular fisheries. Many of which have collapsed due to over exploitation and lack of solutions to the social dilemma. In the relationship between society and its ecosystem. There is embarrass in the form of ecosystems functions that are required to deliver the ecosystem services such as clean water so that people can go fishing or gets clean air to breathe in. These are most effectively managed through social and cultural frameworks of coordination. "The dynamics of most terrestrial ecosystems may be described in terms of the sequential interaction between four system functions; exploitation (represented by those ecosystem processes that are responsible for rapid colonisation of disturbed ecosystems); conservation (as resource accumulation that builds and stores energy and material); creative destruction (where an abrupt change caused by external disturbance releases energy and material that have accumulated during the conservation phase)" (Samways, 2005).

Traditional societies through their close interaction with their local ecosystem and cultural integration were able to live sustainably for prolonged periods using traditional social institutions to manage the commons with the industrial revolution. "Despite the ill-recognition of these traditional management practices by the state organs, traditional communities have for centuries maintained these practices to ensure the survival of the forests on grounds of spiritual and ecological values"(Mohamed Behnassi, 2014; Samways, 2005). Many of these traditional socio-cultural institutions were disintegrated and modern nation states become the new form of social contract that has in manyways taken over this function providing the social institutions for managing the commons but over the past few decades as economies have developed beyond national borders into an increasingly integrated global economy with an associated effect on the global biosphere.

There are many questions as to whether the nation based social contract still fit the services within this new global context. The tragedy of the commons is essentially a failure of trust coordination and social institutions when everyone can trust everyone to cooperate; then, often an optimal global outcome can be achieved but it typically requires some form of social contract to achieve that and those social contracts are enable by strong social institutions of some kind. The government resilience policy should help in this aspect to empower and establish strong social institution or creating social cohesions among people.

Socio-ecological systems are highly complex that they involve not only technology; economic frameworks and strong social institutions to support strong cultural dimension of the society. The ecosystem within which they inhabit forms an integral part of their way of life and interpretation of reality. This interpretation forms the basis for how they interact with the natural environment. Some societies revere their natural environment while others would

appear to care little about their environment. This cultural aspect plays a big role in the whole dynamic within socio-ecological systems. All individuals and societies have a schema with which they interpret their environment somewhat coherent belief system about how the world is and place within it. On a cultural level people live their lives based upon a narrative that is emotionally and conceptually appealing and endorsing it doesn't have to be logically consistent. For example, discussing about the theory of biological evolution for over a century not but its reported that 40% of Americans don't adhere to it not because of its logical inconsistencies because of its lack of consistency with their pre-existing schema people group.The whole societies go on functioning by creating narratives that offer them a coherent picture of how the world works at a level of complexity that they can deal with. Indonesia is a very cultural society and any attempt to alter or introduce new culture may be futile. "The dynamics of most terrestrial ecosystems may be described in terms of the sequential interaction between four system functions; exploitation (represented by those ecosystem processes that are responsible for rapid colonisation of disturbed ecosystems); conservation (as resource accumulation that builds and stores energy and material); creative destruction (where an abrupt change caused by external disturbance releases energy and material that have accumulated during the conservation phase)" (Lance H. Gunderson, Craig R. Allen, 2010; Samways, 2005). On that note, environmental protection and conservation is a necessity and world leaders should convert their commitment to sustainable development goals into actions with the political will to full utilize the potentials of this development priority in improving the standard of living of the people.

DISCUSSION: RAINFALL PATTERN AND DISADTER – INDONESIA AND GAMBIA

Indonesia has 17, 000 Islands and most of them are mountainous with several volcanos. The rainfall pattern in Indonesia is seasonal but it varies from one region to another while Gambia is small country with the same rainfall pattern and similar weather condition. However, agriculture sector remains the biggest employer in both country 70 – 80%. The stable food of these countries is rice and several farms engage in rice production either in large scale or small to earn a living. Though, Indonesia has advance drastically towards mechanization of agriculture sector while the Gambia still uses the traditional methods of farming.Th Gambia usually experience three-month rainfall on yearly basis and during this period (July – September) several flood disasters occur due to heavy rainfall and poor city or town planning. The same applied to Indonesia. It always flooded in highly populated areas and during last rainfall in Surabaya, places get flooded in east Surabaya.

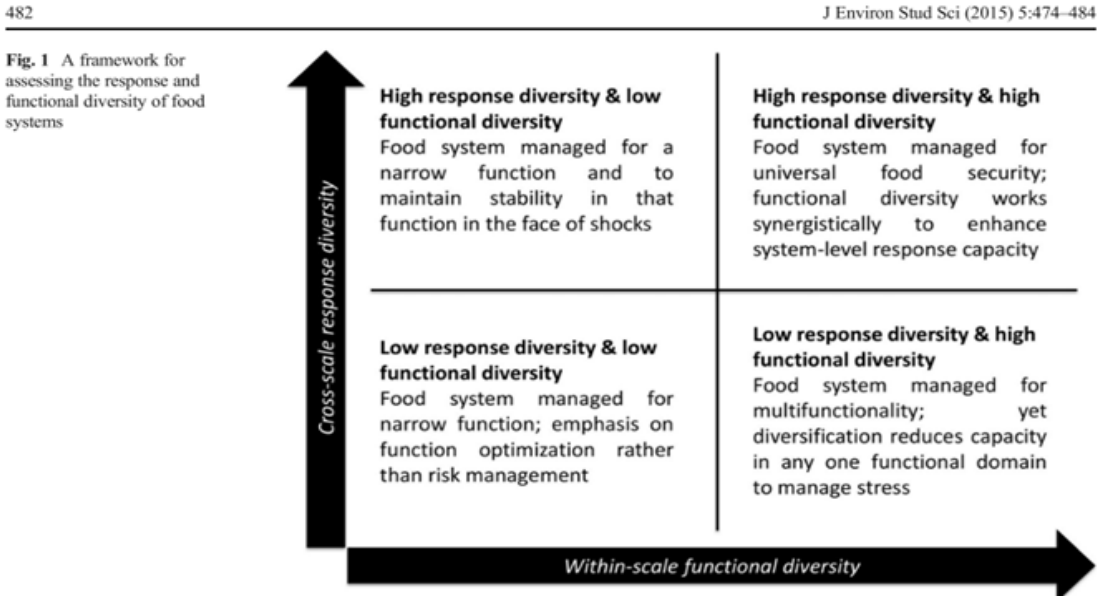
The government had formulated a disaster management policy and promulgated a disaster management Bill aimed at building safe and resilient communities by enhancing the use of and access to knowledge and information in disaster prevention and management at all levels of society. This clearly testifies the national concern on this hindrance to sustainable

development. The policy and bill clearly pave the way for ensuring that we work together for a safer world and country and in order for the country to attain its Vision 2020, poverty reduction and millennium development goals, disaster management is crucial and forms an integral part of the process.In terms of international cooperation, significant progress has been made in terms of the implementation of international obligations. For example, The Gambia has adopted international policies and strategies such as the Hyogo Framework for Action (HFA), the Africa Regional Strategy and Plan of Action and ECOWAS Disaster Risk Reduction Strategy among many others.

Overall, it is observed that the level of regulation in disaster management is inadequate. The Disaster Management Act 2008 cannot and does not outline all the various processes and procedures relating to disaster Management and response as well as disaster response coordination. In this regard, it will be important to develop subsidiary legislation to incorporate the various issues and developments that are not captured in the Act and those that need clarification. “There will always be the potential for conflicts of interest between rural people's ability to earn a living and the conservation of areas of high ecological value. Conservation and sustainable development projects can aim to mitigate such conflicts of interest by promoting alternative income sources and education programmes” (DRR policy of Gambia).

“A great deal of work on the 2004 Indian Ocean tsunami has shown the power of social networks in the process of recovery. On the 26 December 2004 a “megathrust” earthquake of at least a 9.0 magnitude struck off the west coast of Sumatra, Indonesia and set off tsunami as tall as 100 ft in some areas. The tsunami devastated coastlines in India, Sri Lanka, and Indonesia, killing close to 200,000 people across these areas, with 35,000 killed in Sri Lanka” (Aldrich, 2015). This shows the occurrence of disaster in Asia and Indonesia in particular. On 5 August, a 7.0 magnitude earthquake struck the island of Lombok in Indonesia, with its epicentre located inland in North Lombok. The area had already been impacted by a 6.4 magnitude earthquake on 29 July, with its epicentre in East Lombok. On 9 August, the island was again hit by a 6.2 magnitude earthquake, creating panic among the population and further hindering the rescue efforts. The three earthquakes were followed by a number of strong aftershocks causing widespread structural damage to shelter and public infrastructure, injuring some 2,000 people and killing at least 279 people. Data regarding displacement is ongoing but preliminary reports indicate that over 270,168 displaced people are in need of food, water, shelter, and health assistance. At least 64,534 houses have been damaged. It was reported the rescue efforts were hindered because of accessibility problem. The roads were bad damaged and electrical wires are expose to danger. According acaps report “foods needs have been reported in all affected locations as families have lost access to their livelihoods and food stocks have been lost or damaged. The earthquake took place at the peak of the tourist season. Though Lombok is not as visited as neighbouring Bali, tourism is an

increasingly important part of the local economy. It is not yet clear how the consecutives earthquake will affect the industry"(Report, 2018). Disaster response efforts are well coordination in Indonesia unlike the Gambia where in NGOs and government agency are always overlapping in such situation. The Act that establish this agency does not full empower the agency to coordinate and strategize disaster response activities. This is not the case in Indonesia where as all organisation should contact the Disaster Management Agency for any response activity and report be submitted to them upon completion. Indonesia is more vulnerable to disaster than the Gambia which is flat land with 88% percent of arable land.



Source: (Hodbod & Eakin, 2015)

This figure shows the response level to food system in terms of crisis or disasters. However, continuity in the provision of emergency services will likely be lost resulting in ineffective overall emergency management by separating search and rescue from the national disaster management system (NDMS) and subjugating all operations and operators of the NDMS (including those of the Council and the Agency, as stipulated in Section 4 of The Gambia) to the National Search and Rescue Commission (NSRC). The limitation of the agency is clearly manifested and the act need to be amended to accord the full responsibility of the agency vest in her.

"Applying a resilience perspective should highlight the importance of diversity within the food system and lead for change over stability, or loss over conservation. Rather, a resilient food system recognizes that all of these attributes are essential for maintaining system

function, learning, and adaptation. The challenge is to achieve the appropriate balance among these attributes at all scales and for all functions so not to compromise the fundamental moral obligation to ensure food security for all"(Hodbod & Eakin, 2015; Norberg-Hodge, 2006). Governments should be more responsive to the needs of their people and resilience policy is hardly known to the people. Sometimes, culture play a significant role in resilience of food system since food security is not only an economic issue but a moral incantation.

CONCLUSION

Resilience of the food system in the socio-ecological perspective is a catalyst to enhancing food security and eradicate food insecurity. This require proper management with foresight to prepare for the eventualities such as natural disasters, flood, rain shortage, earthquakes, etc. So that the people could not severely feel the impact of these uncertainty and capacity to cope with situation will be put in place accordingly.

It is relevant to maintain or establish the functional and response diversity crucial to food security and socio-ecological system will advance the viability of the food system. Resilience in food systems is governed by multiple factors that need to be put into consideration for better advancement of food system to support human society. Socio-ecological resilience has the capacity promote sustainability in food system. Food is a need and for better functioning of human society; food system most have multiplier and amplifiers to enhancing food security.

The challenges of the system should overcome through formulation of responsive policies that support continuity and progress of human society. Food safety should be encouraged to reduce malnutrition and malfunctions of the food system. The overall objectives of the system are to supply people with the required food nutrients and energy to support the well-being of the people. With all the challenges, it is to mentioned with conviction that there is a benefit to viewing food systems through a resilience lens. The disturbance inevitably in the system since it gives you the opportunity to create more diversity system that can aid the adaptive capacity to withstand stress or shock. The effects of multiple scales require understanding of the food system which has multiple values. Adaptive resilience to the unique attributes of human food systems is considered the critical importance to diversity, the moral foundations for management, and the temporal trade- offs that are so critical for sustainability.

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